

REMARKS

This responds to the Office Action mailed on December 1, 2005.

Claims 1 and 11 are amended, no claims are canceled, and no claims are added; as a result, claims 1-29 are pending in this application.

§103 Rejection of the Claims

Claims 1-11, 14-17, 19, 21-23, 26, 28, and 29 were rejected under 35 USC § 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vitas et al. (U.S. 6,751,099).

The Examiner relies upon the following passages in the Toy patent to show obviousness: col. 3, lines 52-60; col. 4, lines 22-65; col. 5, lines 1-5 and 20-23 and 41-60; column 6, lines 14-30 and lines 61 through col. 7, line 31. The Examiner admits that the Toy et al. reference does not describe the following features:

- metal combinations such as Ni/Au, Au/Ag, Cu/Au, Cu/Ag and Cu/Ni;
- a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid;
- a checkered square grid;
- circles;
- a bull's eye;
- corner squares;
- and/or a central square

The Toy reference describes only homogeneous coatings with no design at all and provides no motivation to combine with a reference that does not have a homogeneous coating. Furthermore, the Toy reference does not describe even a homogeneous coating that is "effective for bonding to solder and for adhering to polymer in a thermal interface material." The Toy reference discusses only a homogeneous coating that bonds with adhesive and not solder bonding.

The Examiner has stated however that "Vitas teaches a heat dissipating device wherein two metals are one or more of the combinations of Ni/Au, Al/Ag, Cu/Au, Cu/Ag and Cu/Ni; and a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid.

In citing the Vrtis et al. patent, the Examiner relies upon passages in column 2, lines 36-47; column 2, lines 66 through column 3, line 18; column 3, lines 14-30; and column 4, lines 6-12. These passages describe a use of organic surface protectant (OSP) to cover a heat spreader. Col. 6, lines 11-14 describes the "invention" as providing "an adhesion promoting layer affording good bonding between polymeric adhesives and metals otherwise having poor direct adhesion." The patent notes that heat spreaders with surface oxides may adhere poorly to inorganic and inorganic-organic thermal interface materials, TIMs. The patent states that, "One solution is to plate the heat spreader with a gold layer over a nickel layer ("Au/Ni finish") to protect against corrosion by preventing oxides from forming." The patent also states that the Au/Ni finish provided an "unsatisfactory solution."

The Au/Ni finish in the Vrtis et al. patent is described as a gold layer over a nickel layer. Thus, there is no "main body having an outer surface that is plated or coated with at least two different metals wherein all of the at least two different metals contact the outer surface to form a design effective for bonding to solder and for adhering to polymer in a thermal interface material." as is claimed because the main body having an outer surface in the Vrtis et al. patent is plated or coated with only one metal, gold or nickel but not both. Thus, even if Toy et al. were to be combined with Vrtis et al., the combination would not suggest the claimed embodiments herein. Neither the Toy et al. reference nor the Vrtis et al. reference describes a "main body having an outer surface that is plated or coated with at least two different metals wherein all of the at least two different metals contact the outer surface to form a design effective for bonding to solder and for adhering to polymer in a thermal interface material." as is claimed

Additionally, the Vrtis et al. patent does not describe any coating or plating that forms "a design effective for bonding to solder and for adhering to polymer in a thermal interface material." No "design" is described or shown.

Furthermore, the Vrtis et al. patent admits that the gold layer over a nickel layer did not provide a satisfactory solution. Thus, the applicant asserts that the Vrtis et al. patent does not

suggest combination with the Toy et al. patent and even if, *arguendo* the references were combined, the combination does not suggest claimed invention embodiments.

Claims 12, 13, 18, 20, and 27 were rejected under 35 USC § 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vrtas et al. (U.S. 6,751,099) as applied to claims above, further in view of McCullough (U.S. 6,803,328). For reasons discussed above, the Vrtas et al. patent does not suggest combination with the Toy et al. patent and even if, *arguendo* the references were combined, the combination does not suggest claimed invention embodiments. The addition of a third reference, McCullough, does not render claims 12, 13, 18, 20 and 27 obvious because the Toy et al. and Vrtas et al. patent do not render claimed embodiments obvious. The McCullough reference does not describe the following features either:

- metal combinations such as Ni/Au, Al/Ag, Cu/Au, Cu/Ag and Cu/Ni;
- a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid;
- a checkered square grid;
- circles;
- a bull's eye;
- corner squares;
- and/or a central square

Thus, the Applicant asserts that the combination of references does not render claims 12, 13, 18, 20, and 27 obvious.

Claims 24 and 25 were rejected under 35 USC § 103(a) as being unpatentable over Toy et al. (U.S. 5,931,222) in view of Vitas et al. (U.S. 6,751,099) as applied to claims above, further in view of Kao et al. (U.S. 6,602,777).

For reasons discussed above, the Vrtas et al. patent does not suggest combination with the Toy et al. patent and even if, *arguendo* the references were combined, the combination does not suggest claimed invention embodiments. The addition of a third reference, Kao et al., does not render claims 24 and 25 obvious because the Toy et al. and Vrtas et al. patent do not render

claimed embodiments obvious. The Kao et al. reference does not describe the following features either:

- metal combinations such as Ni/Au, Al/Ag, Cu/Au, Cu/Ag and Cu/Ni;
- a design effective for bonding to solder and for adhering to polymer in a polymer solder hybrid;
- a checkered square grid;
- circles;
- a bull's eye;
- corner squares;
- and/or a central square

Thus, the Applicant asserts that the combination of references does not render claims 24 and 25 obvious.

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

Serial Number: 10/612,834

Filing Date: June 30, 2003

Title: HEAT DISSIPATING DEVICE WITH PRESELECTED DESIGNED INTERFACE FOR THERMAL INTERFACE MATERIALS

Assignee: Intel Corporation

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Dkt: 884.945US1 (INTEL)

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney ((612) 373-6976) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

Respectfully submitted,

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Date 3 April 06

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 3rd day of April, 2006.

Name

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Signature